

AMENDMENTS TO THE CLAIMS

Please cancel Claims 1-8 and 11-24, without prejudice.

Please amend Claims 9 and 10, and add Claims 25-30 as follows.

1-8. (Cancelled)

9. (Currently amended) A chemical liquid injector for injecting a chemical liquid from a liquid syringe including a cylinder member and a piston member slidably inserted into the cylinder member into a patient through an extension tube, comprising:

a cylinder holding mechanism for removably holding a cylinder member of a liquid syringe;

a piston driving mechanism for moving a piston member relative to the held cylinder member;

a wave emitting element for emitting an ultrasonic wave to a predetermined position on an outer surface of the held cylinder member at a predetermined angle;

a wave detecting element for detecting the ultrasonic wave at a predetermined position on the outer surface of the held cylinder member; and

a computer unit characteristic analyzing means for analyzing a resonance characteristic of the detected ultrasonic wave[;:], determining the type of the liquid from the analyzed resonance characteristic, determining the presence or absence of an air bubble in the liquid from the analyzed resonance characteristic, detecting a foreign substance in the liquid from the analyzed resonance characteristic and controlling the operation of the piston driving mechanism based on the result of the determination and the detection.

abnormality determining means for determining occurrence of abnormality from the analyzed resonance characteristic; and

alarm notifying means for outputting a check alarm when the occurrence of abnormality is determined.

10. (Currently amended) A chemical liquid injector for injecting a chemical liquid from a liquid syringe including a cylinder member and a piston member slidably inserted into the cylinder member into a patient through an extension tube, comprising:

a cylinder holding mechanism for removably holding a cylinder member of a liquid syringe;

a piston driving mechanism for moving a piston member relative to the held cylinder member;

a wave emitting element for emitting an ultrasonic wave to a predetermined position on an outer surface of an extension tube at a predetermined angle;

a wave detecting element for detecting the ultrasonic wave at a predetermined position on the outer surface of the extension tube; and

~~a computer unit characteristic-analyzing-means for analyzing a resonance characteristic of the detected ultrasonic wave[[:]], determining the type of the liquid from the analyzed resonance characteristic, determining the presence or absence of an air bubble in the liquid from the analyzed resonance characteristic, detecting a foreign substance in the liquid from the analyzed resonance characteristic and controlling the operation of the piston driving mechanism based on the result of the determination and the detection.~~

~~abnormality-determining-means for determining occurrence of abnormality from the analyzed resonance characteristic; and~~

~~alarm-notifying-means for outputting a check alarm when the occurrence of abnormality is determined.~~

11-24. (Cancelled)

25. (New) The chemical liquid injector according to claim 9, wherein the computer unit notifies the determined type of the liquid by displaying data.

26. (New) The chemical liquid injector according to claim 10, wherein the computer unit notifies the determined type of the liquid by displaying data.

27. (New) The chemical liquid injector according to claim 9, wherein the computer unit outputs an alarm when an occurrence of an abnormality is determined.

28. (New) The chemical liquid injector according to claim 10, wherein the computer unit outputs an alarm when an occurrence of an abnormality is determined.

29. (New) The chemical liquid injector according to claim 9, wherein the computer unit forcibly stops the piston driving mechanism when the foreign substrate is detected.

Application No.: 10/580,614
Filing Date: April 18, 2007

30. (New) The chemical liquid injector according to claim 10, wherein the computer unit forcedly stops the piston driving mechanism when the foreign substrate is detected.